ABSTRACT OF THE DISCLOSURE

Methods and apparatus for controlling a polyphase motor in implantable medical device applications are provided. In one embodiment, the polyphase motor is a brushless DC motor. The back emf of a selected phase of the motor is sampled while a drive voltage of the selected phase is substantially zero. Various embodiments utilize sinusoidal or trapezoidal drive voltages. The sampled back emf provides an error signal indicative of the positional error of the rotor. In one embodiment, the sampled back emf is normalized with respect to a commanded angular velocity of the rotor to provide an error signal proportional only to the positional error of the motor rotor. The error signal is provided as feedback to control a frequency of the drive voltage. A speed control generates a speed control signal corresponding to a difference between a commanded angular velocity and an angular velocity inferred from the frequency of the drive voltage. The speed control signal is provided as feedback to control an amplitude of the drive voltage. In one embodiment, an apparatus includes a brushless DC motor and a commutation control. The commutation control provides a commutation control signal for a selected phase of the motor in accordance with a sampled back electromotive force (emf) of that phase. The back emf of the phase is sampled only while the corresponding drive voltage for the selected phase is substantially zero, wherein a frequency of a drive voltage of the motor is varied in accordance with the commutation control signal.